

ABSTRACT OF THE DISCLOSURE

[0027] An apparatus using electrically stimulated smart material requires a power source to stimulate the material. This power source has three main functions, (1) to apply a known voltage potential across the smart material, (2) to convert from the control voltage to a level suitable for the smart material, and (3) to regulate the voltage based on a control input. The power source is a DC to DC converter with special properties achieved by supplying a variable stimulating voltage or actively discharging the actuator. The circuit also provides a dead band, or hysteresis, between the charge point and discharge point. When this circuit is applied with a proportional, mechanically leveraged smart material actuator, a general-purpose industrial actuator becomes a cost-effective solution.